REMARKS

Applicant has amended the specification to correct typographical errors and amended claims 2-3 to promote clarity. No new matter has been introduced by the amendment. Claims 1-12 are currently pending. According to the Office Action, the pending claims include only claims 1-6, not claims 7-12. However, claims 7-12 were presented in Applicant's preliminary amendment filed together with this application and their consideration of requested.

Claims 1-6 were rejected or objected to by the Examiner. To complete the record, Applicant will also discuss claims 7-12 in this document. Reconsideration of the application, as amended, is requested in view of the remarks below:

Objection of claims 4-5

Claims 4-5 were objected to by the Examiner for being dependent on a multiple dependent claim. See the Office Action, page 2, first paragraph.

Applicant already amended these two claims in the preliminary amendment to correct the multiple dependency, and respectfully request withdrawal of this objection.

Rejection of claims 1-3 and 6

I

Claims 1-3 and 6 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite, on three grounds: (1) in claims 1 and 6, it is unclear in what respect a "superabsorbent" polymer can be distinguished from a merely absorbent one; (2) in claim 2, it is unclear how one distinguishes a "desired" from an undesired metal ion; and (3) in claim 3, it is unclear what constitute a "convenient" form distinguished from an inconvenient support form. See the Office Action, page 2, second paragraph.

Referring to grounds (2) and (3), Applicant has amended claims 2 and 3 to delete the terms "desired" and "or other convenient form," respectively.

Turning to ground (1), Applicant first would like to point out that the term "superabsorbent" is well used in the art to refer to the capacity of absorbing a significant amount of water (or other solvent) in a short time, as compared to "merely absorbent." See, e.g., U.S. Patent No. 4,725,629 (cited at page 3, line 15 of the present application; relevant page attached

as "Exhibit A"). This patent reads at column 1, lines 42-48, that "... numerous efforts have been made to either modify the physical properties of polyurethane foams or to prepare specialized polyurethane foams having unique properties. A particularly sought-after property is increased water absorbency. Polymers having this property often are referred to as hydrogels or **superabsorbents**" (emphasis added). Similarly, U.S. Patent No. 6,297,337 (relevant page attached as "Exhibit B") reads at column 2, lines 6-10, that "[c]rosslinked ionic hydrogel polymers may be divided into two groups of materials: those which may be used for thickening, suspending and bioadhesive applications and those which may be used as **superabsorbant** material" (emphasis added).[1]

A skilled person in the art can distinguish "superabsorbent" polyurethane foam (superabsorbent PUF) from a "merely absorbent" PUF (referred to as "conventional PUF" hereinafter) not only by their solvent-absorbing capacity, but also by their preparation methods.

One difference is the amount of water that is required in preparing conventional PUF and superabsorbent PUF. Conventional PUF is generally prepared by reacting a polyol with an isocyanate in the present of **a very small amount of water**, together with a tin-based catalyst, an amine-based catalyst and a silicone polymer to control cell structure and cell opening. See, e.g., British Patent No. 1,209,058 (cited in the specification at page 3, line 27; relevant page attached as "Exhibit C"), Examples 1 and 2 at pages5-6. By contrast, superabsorbent PUF is generally prepared in **an aqueous solution**. See, e.g., claim 1 of U.S. Patent No. 4,725,629 (attached as "Exhibit D").

For the reasons set forth above, Applicant submits that the term "superabsorbent" is definite.

II

Claims 1-3 and 6 were also rejected by the Examiner under 35 U.S.C. § 102(b) as being anticipated by WO 96/28251 and WO 94/00237. Applicant respectfully traverses as follows

Claim 1, an independent claim, will be discussed first. It covers an ion exchange material containing superabsorbent PUF which includes an ion exchange medium within.

---

[1] The term "superabsorbent" and the term "superabsorbant" are interchangeable.

WO 94/00237 discloses an ion exchange resin containing a polyurethane matrix. The polyurethane matrix is not superabsorbent PUF, as required by claim 1.[2] For the reasons set forth in Part I above, WO 94/00237 does not anticipate claim 1.

WO 96/28251 discloses an ion exchange material containing a PUF. This PUF is also not a superabsorbent PUF, as required by claim 1.[3] WO 96/28251 therefore also does not anticipate claim 1.

Claim 2-5 and 7-12 depend from claim 1. For the reasons set forth above, they are not anticipated by WO 96/28251 or WO 94/00237.

Claim 6, the other independent claim, covers a process of extracting metal ions from solutions or slurries by using an ion exchange material which include a superabsorbent PUF. As mentioned above, a superabsorbent PUF is not taught in either WO 96/28251 or WO 94/00237. Thus, claim 6 is also not anticipated by WO 96/28251 or WO 94/00237.

CONCLUSION

For the remarks above, Applicant submits that claims 1-12, as amended, are now in condition for allowance. Attached is a marked-up version of the changes being made by the current amendment.

Pursuant to 37 CFR § 1.136, Applicant hereby petitions that the period for response to the Office Action dated October 1, 2001, be extended for three months to and including April 1, 2002. Enclosed is a check for $460 for the required fee.

---

[2] WO 94/00237 does not teach using a large amount of water to prepare PUF. See, e.g., Example 1 at page 14. Thus, the PUF disclosed in WO 94/00237 is not a superabsorbent PUF. See the discussion in Part 1 above.

[3] Like WO 94/00237, WO 96/28251 does not teach using a large amount of water to prepare a PUF. See, e.g., Example 1 at pages 9-10. Thus, the PUF disclosed in WO 96/28251 is also not a superabsorbent PUF.

Please apply any other charges to Deposit Account No. 06-1050.

Respectfully submitted,

Date: 4-1-02

Y. Rocky Tsao

Y. Rocky Tsao, Ph.D., J.D.
Attorney for Applicant
Reg. No. 34,053

Fish & Richardson P.C.
225 Franklin Street
Boston, Massachusetts 02110-2804
Telephone: (617) 542-5070
Facsimile: (617) 542-8906

20410797.doc

Version with markings to show changes made

In the specification:

The paragraph beginning at page 1, line 7 has been amended as follows:

-- Ion exchange resins are generally manufactured in bead or particulate form from polymers such as polystryrene-divinyl benzene, acrylic, or phenol-formaldehyde condensates. It has been proposed that ion exchange fibres can be produced from either polyacrylonitrile onto which active ligands can be attached, or polypropylene fibres on to which polystyrenedivinyl benzene can be grafted. Polyurethane foams have been proposed in PCT/AU93/00312 and PCT/AU94/00793 which are incorporated herein in their totality by reference. --

The paragraph beginning at page 3, line 15 has been amended as follows:

-- In U.S. Patent No. 4,725,629 a superabsorbent polyurethane foam is described which is based upon an interconnecting polymer network of a cross-linked polyurethane and a cross-linked addition polymer container a plurality of chain segments made up of functional groups containing repeating units which may be the same of different. These superabsorbent polymers are recommended for the manufacture of absorbent articles, especially disposable absorbent articles, such as nappies, sanitary napkins, bedpads, incontinent pads, and the like. --

The paragraph beginning at page 4, line 19 has been amended as follows:

-- The ion exchange medium may be any convenient ion exchange medium suitable for sorbbing the desired metal ions from the solution and/or slurry. The ion exchange medium may be in the form of a bead, resin, fibre, foam, or liquid [or other convenient form]. --

The paragraph beginning at page 6, line 29 has been amended as follows:

-- A commercially available MDI compound with especially desirable properties is Isonate 143L which is produced by reacting MDI to form the carbodiimide and this material in turn reacts to form a tri-functional cycloadduct. The mixture of MDI, the [carbodiitide] carbodiimide and the cycloadduct are in equilibrium. The mixture contains a major amount of pure diphenylmethane diisocyanate and minor amounts of carbodiimides and trifunctional

cycloadducts of diphenylmethane diisocyanate. As described, the term derivatives of diphenylmethane diisocyanate mean products that have been made from MDI as a starting material. It includes adducts dimmers, and trimers. --

The paragraph beginning at page 8, line 11 has been amended as follows:

-- Superabsorbant microcellular resins and foams differ from [the above] polyurethane foams in that they are normally produced by the reaction of a suitably formulatend isocyanate terminated polymer with a very significant excess of water. The polyol portion of the polymer is generally based upon poly(oxyethylene) glycol, and the isocyanate component is generally TDI, MDI or MDI-based isocyanate or mistures of both isocyanantes. --

The paragraph beginning at page 9, line 11 has been amended as follows:

-- Thermal reticulation may be advantageously conducted whereby the windows or membranes are removed from individual cells or bubbles which make up the foam structure. Reticulation results in a foam preferably having at least 95% of open cells and most preferably 99% open cells. Thermal reticulation of polyurethane foam is a known procedure to those skilled in the art and as disclosed for example in U.S Patent Nos. 3,171,820 and 3,875,025 and 3,175,030. Reticulation is achieved by providing a combustible mixture of an oxidizer material and an oxidisable material within whereupon the cell windows or membranes are destroyed. It is also possible to swell the polyurethane foams in an organic solvent to increase the cell size. --

The paragraph beginning at page 13, line 10 has been amended as follows:

-- Other methods for the preparation or application of these polymers are typically [describes] described in US Patent Nos. 3,793,241; 3,845,535; 3,861,993; 3,890,254; 3,900,030; 3,903,232; 3,904,557; 4,110,508; 4,127,516; 4,137,200; 4,158,087; 4,160,076; 4,181,770; 4,226,043; 4,292,412; 4,314,034; 4,365,025; 4,337,645; 4,384,050; 4,384,051; 4,717,738; 4,725,628; 4,731,391; 4,740,528; 4,789,720; 4,798,876; 4,828,542; 5,065,752; 5,296,518; 5,591,779; and 5,624,971 incorporated herein by reference. --

The paragraph beginning at page 13, line 22 has been amended as follows:

-- Advantageously the ability to incorporate large volumes of water into formulation provides an opportunity to incorporate water-based polymer emulsions directly into the polymer. This cannot generally be achieved by the application of conventional polyurethane foams. Water-based polymers eliminate the requirement for solvents in the polymer preparation and therefore eliminate the need to remove and capture environmentally undesirable solvents. Typically, such emulsions may be water-based emulsion resulting from the reaction of vinylidene diphosphonic acid with polyurethane foam, [any] offer exceptional selectivity for [FE (III)] Fe(III) in the presence of Cu(II) in acid solutions commonly encountered in copper electrowinning tankhouse beel streams. --

The paragraph beginning at page 15, line 5 has been amended as follows:

-- The polymer produced was used to remove gold cyanide and copper [apinade] cyanide from aqueous solutions and slurries. --

In the claims:

Claims 2 and 3 have been amended as follows:

2. (Amended) An ion exchange material according to claim 1 wherein the ion exchange medium is selected for sorbing [desired] metal ions from a solution and/or slurry.

3. (Amended) An ion exchange material according to claim 1 wherein the ion echange medium is in the form of a bead, resin, fibre, foam, **or** liquid [or other convenience form].